Lori – Nick – COPY

Confederated Tribes and Bands
of the Yakama Nation

Established by the
Treaty of June 9, 1855

May 19, 2004

Keith Klein, Manager
Richland Operations Office
U.S. Department of Energy
P.O. Box 550
Richland, Washington 99352

Re: Stabilization and disposal of sludge from the 100 K East Basin

Dear Mr. Klein –

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63147

It is come to our attention that the Energy department will begin removal and stabilization of degraded spent fuel sludge from the 100 K East Basin for disposal in the Waste Insolation Pilot Project in New Mexico as transuranic wastes.

The Yakama Nation objects to reclassifying these wastes as transuranics, since the preponderance of the sludge, in terms of weight and radioactivity, resulted from degradation of spent reactor fuel (see attached table). DOE has not provided a technical and legal justification that demonstrates that the K-basin sludge and spent reactor fuel are not one and the same. Proceeding with this effort sets a dangerous precedent, in terms of processing safety at Hanford and disposal risks in the Waste Isolation Pilot Plant, which was not constructed for DOE high-level waste or spent reactor fuel disposal.

As DOE's data clearly indicates, the K- Basin sludge is primarily the byproduct of the degradation of spent uranium-metal reactor fuel. It comprises a volume of approximately 52 cubic meters and is composed of irradiated corroded spent reactor fuel, aluminum and zirconium, windblown material and miscellaneous materials, such as ion exchange material (both organic and inorganic) and paint chips.[1]

The wastes are highly radioactive and contain as much as 878,000 curies of radioactive materials, of which about 12 percent are transuranics.[2] The mixture of radionuclides in the sludge is the same as found in the spent fuel.

The Yakama Nation has several safety concerns:

[1] DOE/EIS-0189-SA2, K-Basin Sludge Inventory, table 3.22.

[2] Ibid.

- High levels of radiostrontium and radiocesium in the sludge pose safety concerns because of high-radiation dose rates, and decay heat build-up during storage, retrieval and processing.

- Generation of hydrogen gas from the corrosion of metallic uranium (hydration), which makes up more than half of the sludge weight, poses potentially significant fire and explosion risks[3] As the uranium corrodes and hydrogen is trapped, the sludge is estimated to expand from 1.6 to 12.9 times its original volume.[4]

- The processing and storage of k-basin sludge is expected to result in further hydrogen gas generation and sludge growth, which could over-pressurize canisters and poses explosion and fire risks. DOE-sponsored research indicates that hydrogen gas generation "may take years of subsequent uranium compound oxidation to reach the projected end-state uranium compound distribution."[5] The potential worker exposure from a waste drum explosion at Hanford was reported by the Defense Nuclear Facility Safety Board staff to be the lethal range of 640 rem.[6]

If the sludge were treated for disposal as high-level waste DOE estimates that it would result in a glass volume between 56 and 170 square meters and add 20 to 40 days to the operation of the Waste Treatment Plant. [7]

The DOE should provide safety basis details and subsequent safety controls to assure the public that the risks associated with this highly radioactive and potentially flammable or explosive material are being responsibly addressed.

The Yakama Nation urges the department to abandon its ill-conceived decision to reclassify K-basin sludge as transuranic waste, and proceed to stabilize these materials in a transparent manner that ensures public and worker safety, for subsequent disposal as high-level wastes.

Sincerely,

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[3] Ibid.

[4] A. J. Schmidt C. H. Delegard, Updated Volumetric Expansion Factors for K Basin Sludge During Storage, PNNL-14228, March 2003. Table S.1, p. iv

[5] Ibid

[6] Defense Nuclear Safety Facilities Safety Board, Staff Issue Report October 13, 2003 MEMORANDUM FOR: J. K. Fortenberry, Technical Director FROM: D. Ogg, SUBJECT: Transuranic Waste Retrieval, Hanford Site, p.3.

[7] U.S. Department of Energy, Supplement Analysis for the Tank Waste Remediation System, DOE/EIS-0189-SA2, May 1998, p. 42.